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SQUAB
RAISING



THREE HAS BEEN increasing interest in the production of good-quality squabs as a side issue on farms and in towns. Squab production as a special business has also increased.

Satisfactory returns from this enterprise depend on the use of suitable breeding birds, selected for large production of quality squabs, and on good equipment, feeds, and markets.

The selection of the foundation stock requires special care because large production of squabs can be obtained only from well-bred stock. The novice cannot determine the age, sex, or breeding quality of pigeons by their appearance.

This bulletin discusses the general management of pigeons for the production of squabs for market.

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SQUAB RAISING

By ALFRED R. LEE, *associate poultry husbandman, and SHEPPARD K. HAYNES,
chief scientific aid, Animal Husbandry Division, Bureau of Animal Industry*¹

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ASQUAB is a young pigeon which is marketed just before it is ready to leave the nest, usually at from 25 to 28 days of age, when it weighs from 12 to 24 ounces.

The increasing importance of the raising of pigeons for squab production is indicated by the growth of commercial pigeon farms and by the increased interest in the production of squabs of better quality as a side issue in the farming sections, as well as in towns and cities. Pigeons are raised in all parts of the United States, but large squab-producing plants have been developed mainly in the Northeastern and Southeastern States, on the Pacific coast, and near the larger cities of the Central Western States.

POSSIBILITIES IN SQUAB RAISING

With good management squabs can be made a profitable source of income to the farmer, the producer who has only a small lot, or the commercial pigeon raiser. Squab production requires very little land as all breeders are kept confined in small pens and houses. Wherever there is a good market, prices received for squabs are usually high enough to make squab production return a fair profit. The average annual return above feed cost varies with squab prices and with management, but it can be estimated by using local prices, allowing an annual production of from 12 to 14 squabs for each pair of breeders, and a feed consumption of from 90 to 100 pounds per pair. Additional income may often be obtained from the sale of breeding stock, especially from high-producing flocks. The raising of pigeons makes a pleasant hobby, and the squabs furnish choice meat for home consumption.

The demand for squabs, especially in large cities, is increasing, and they are often used in place of game fowl. The flesh of a squab contains a larger proportion of soluble protein and a smaller propor-

¹ This publication is a revision of former editions prepared by A. R. Lee.

tion of connective tissue than pigeon flesh; it is a good source of liquid protoplasm and of vitamin G, and is relatively rich in phosphorus. Squab meat has a fine texture and a distinct delicious flavor, is tender and easily digested, and is especially desirable for invalids and convalescents. A squab also is of desirable size for an individual serving.

BREEDS SUITABLE FOR SQUAB RAISING

There are a great many breeds of pigeons, but only those used extensively for squab production are described in this bulletin. These pigeons are selected primarily as prolific producers of good-sized squabs with minor consideration given to selection for type and color. The best breed to use depends somewhat on the market, but the greatest demand is for the breeds that produce good-sized squabs with light-colored skin. The King, Carneau, Mondaine, and giant Homer are good producers of squabs of this type, and carefully selected stock of these breeds should produce at least 12 squabs per pair per year, which should weigh from 14 to 24 ounces each, live weight, at 26 days of age.

Crosses of these and other breeds are also used for squab production. The small, common pigeon that is allowed to fly at will on many farms has not been selected for production as it produces small squabs of poor quality.

KING

The King is a large pigeon and a prolific breeder and is one of the most popular squab producers. The standard weights of old and young cocks are 28 and 26 ounces, respectively; and of old and young hens 26 and 24 ounces, respectively. The King is a tight-feathered breed and has a short and blocky body with a deep keel and a broad breast. The carriage should be erect, with the tail carried horizontally (fig. 1).

The head should be moderately large with a round skull; the neck should be full. Some well-bred flocks of Kings produce from 14 to 16 squabs per pair a year, ranging in live weight from 16 to 24 ounces.

The White King was produced in the United States about 1891 by crossing the white varieties of the Runt, Homer, Maltese, and Duchess. The plumage of the White King, which is the most popular variety, is white throughout all sections and should be tight and close-fitting.

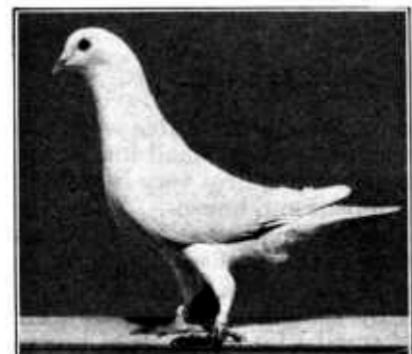


FIGURE 1.—White King, male, a very popular breed for squab production.

The Silver King, another popular variety of this breed for squab production, is not bred so extensively as the White King. Other varieties of Kings include the Blue, the Red, and the Yellow, but these varieties are kept largely for exhibition purposes. The different varieties of the King and other breeds of pigeons are similar in size and type, and they differ chiefly in color and in head points.

CARNEAU

The Carneau originated in France and was not bred in the United States until about 1900. It is a popular breed and produces squabs which are almost as large as those of the King. The standard weights for this breed are: 25 and 23 ounces for old and young cock, respectively; and 23 and 22 ounces for old and young hen. This breed should be tight-feathered. The body is short, compact, and full-breasted; the carriage is upright, with the tail just clearing the ground. The head is of moderate size, with a pronounced rounding of the top of the skull.

The Red and the White are the most popular varieties of this breed, the latter having increased rapidly in popularity as a squab producer in recent years. The plumage of the Red Carneau should be a deep chestnut red throughout (fig. 2), with the color penetrating well into the undercolor. The plumage of the White variety should be white in all sections. Other varieties of the Carneau include the Yellow, the Black, and the Splashed, but these are not used extensively for squab production.



FIGURE 2.—Red Carneau, male, another popular squab producer.

SWISS MONDAINE

The Swiss Mondaine was developed in the United States from the White Runt crossed with other white varieties of pigeons. There is no native breed of this type in Switzerland, nor did the breed originate there, as the name implies.

As a squab producer the Swiss Mondaine has about the same qualities and is approximately the same size as the King but is not raised so extensively. Many flocks of Swiss Mondaines have been bred a little larger than the King and produce slightly larger squabs. The Swiss Mondaine is slightly longer and more slender than the King and does not carry its body so erect. The head is of medium size and is full in front (fig. 3). The standard weights are: 27 and 24 ounces for the old and young cock, respectively, and 24 and 21 ounces for the old and young hen. It is a tight-feathered breed with clean legs. The plumage of the White, which is the only standard variety, is white in every section.



FIGURE 3.—White Swiss Mondaine, male, a good squab producer but not so well known as the King.

FRENCH MONDAIN

The French Mondain is a new breed which is being used to a very limited extent for squab production and is one of the largest breeds, the desired weights being about 29 and 27 ounces for the old and young cock, respectively, and about 28 and 26 ounces for the old and young hen. This breed has a short body and is especially deep and broad breasted, with a comparatively short keel. There are several varieties of this breed, of which the French Gros Mondain and French Conte Mondain are the best known. These varieties are of various colors, the white being most popular for squab production (fig. 4).



FIGURE 4.—French Gros Mondain, male, one of the largest pigeons commonly used for squab production.

is usually a very good breeder, having been bred from the smaller Homers which are noted for these qualities. The type desired for squab production (fig. 5) has a broad, deep breast, is slightly longer and not so compact and blocky as the King. Desired weights for mature cock and hen are 22 and 20 ounces, respectively. This breed is of various colors, of which blue is the most popular, but comparatively little attention has been given to breeding Homers for uniform color except in case of the Blue Homer. The standard color of the Blue Homer is an even shade of light grayish blue in all sections except the head, neck, tail, and ends of the wings, which are much darker. Other types of Homers include the racing, the exhibition, and the show Homer, all of which are much smaller birds.

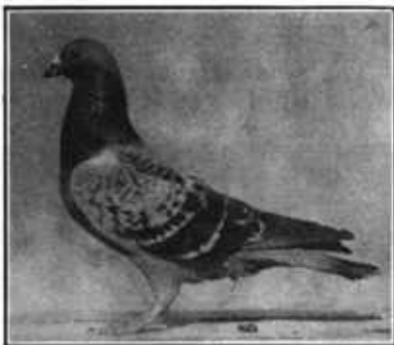


FIGURE 5.—Homer, male. The larger types of Homers are good producers of 1-pound squabs.

OTHER BREEDS

Other breeds kept to some extent for squab production include the Hungarian, the Maltese, and the Runt. Crosses of various breeds are also used for squab production. The Hungarian and the Maltese have short, solid bodies, long legs and neck, and high tails. There are several varieties of the Hungarian, of which the Black (fig. 6) is the most popular.

The Runt is of Spanish origin and is one of the largest pigeons, the old cock weighing 3 pounds. The White Runt (fig. 7) is the best known variety but is a very slow breeder.

SELECTING BREEDERS

One of the essentials of success in squab raising is good breeding stock. It is advisable to buy pigeons from careful breeders who keep accurate records of the production and weights of their squabs and who are willing to guarantee both the age and sex of their stock. It is difficult for the buyer to determine either the age or the sex of pigeons, and many failures in squab raising have been due to the prospective producer's obtaining old pigeons which are past their period of usefulness or to his having a surplus of male birds.

Young pigeons that are nearly ready to begin breeding or young mated pairs should be purchased.



FIGURE 7.—White Runt, male, the largest variety of pigeons but rarely kept for squab production.

A fish net with a short handle is very useful for catching pigeons.

MATING

Pigeons mate in pairs and usually remain with their mates for life. Only mated birds should be allowed in a pen as unmated pigeons, especially males, create a lot of disturbance by fighting and breaking up nests of working pairs.

It is difficult to distinguish sexes when birds are only a few months old, but as the pigeons grow older and begin to mate at about 6 months of age, the male will be noticed driving the hen. The female is usually somewhat smaller and not so coarse as the male, especially in the head and neck, and is not so aggressive as the male. The male struts about with a louder cooing and often drags his tail on the



FIGURE 6.—Black Hungarian, male, a fair squab producer but bred more for exhibition.

ground, while the female rarely struts and usually holds her body more horizontally than the male. The pelvic bones, which are close together in the male, are spread further apart in the female after she begins to lay. The female also has a tendency to waddle when walking and usually holds her tail higher than the male.

Two methods of mating may be practiced: Natural and forced, either of which will give good results. In natural mating the unmated birds are kept in a pen and allowed to select their own mates, which is indicated by the male billing with and driving the female. If they select closely related mates, as shown by the nest bands, the pair should be broken up and allowed to choose other mates. The birds of each pair are banded with colored leg bands having the same number. Forced matings are made by confining the desired male and female in a compartment with feed and water for from 1 to 2 weeks. Then when the pair is well mated the birds are banded and placed in the breeding

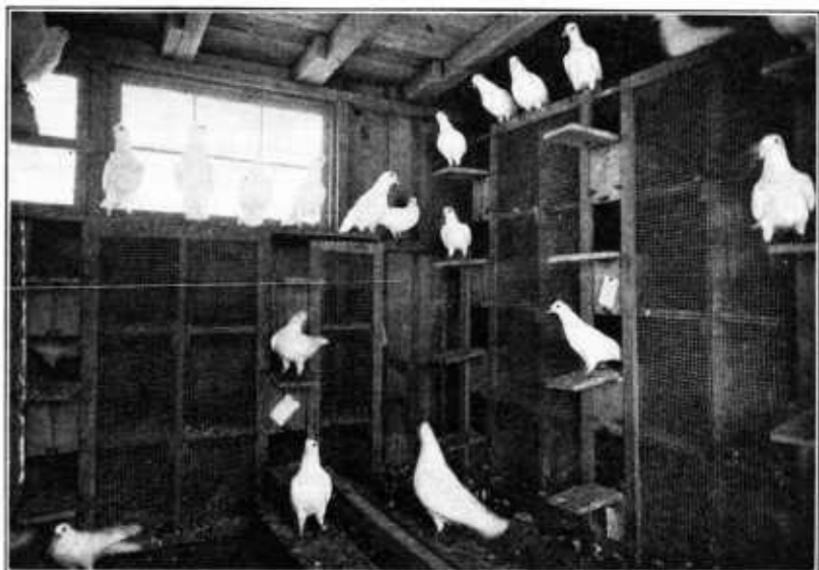


FIGURE 8.—Double nest boxes with wire fronts. These nests may also be used as mating coops.

pen. The nest boxes may be closed and used for mating coops by placing wire frames across the fronts (fig. 8). After a pen is filled with mated birds it is best not to disturb them by making changes unless one is obliged to do so as new birds are likely to fight and may break up the nests of the other pairs. In some cases it may be advisable to break up matings and remate certain birds, such as young male birds and older, good-producing females.

Careful selection and mating of the breeding stock and constant culling are essential in building up a profitable flock of squab producers. Good breeders should produce annually at least 12 squabs per pair, weighing from 12 to 24 ounces, depending on the breed. Pigeons that are poor producers or those that do not approach the standard for color, size, and type of the breed should be culled. Matings should be made to increase vigor and to make the stock more prolific; also to

increase the size of the squabs. Since unusually large birds are likely to be poor breeders, care should be taken not to place too much emphasis on size. Records of mating, production, and rearing should be kept, and squabs for breeding should be saved from the best breeders.

Continued close inbreeding is not a desirable practice for the average squab raiser. Inbreeding, however, tends to fix good as well as undesirable characters, making it a means of either great improvement or marked deterioration, depending on how carefully the matings are made. Intensifying good blood lines by breeding within certain families without inbreeding too closely is desirable in improving production. Care should be taken not to make radical changes in introducing new blood into well-established families.

The use of pure breeds, bred for squab production, rather than the crossing of breeds, is advised for the production of squabs for market. Other principles of breeding, which also apply to pigeons, are discussed in Farmers' Bulletin 1167, *Essentials of Animal Breeding*.

A simple but accurate system of records, showing the band numbers of each pair, should be kept for each pen. When they are 7 to 10 days old the squabs saved for breeders should be banded with numbered seamless bands, commonly made of aluminum. In addition to these bands colored bands, commonly made of celluloid, numbered in duplicate, are put on each pair when the birds are mated, thus making it easy to keep their records. Careful records should be kept of the production of the birds and of the costs of the business. A card should be tacked on each nest showing the band number of the parents, the date the eggs are laid, the date of hatch, the nest bands, weight, and disposition of the squabs. When the squabs are removed these data are transferred to permanent records.

HATCHING AND REARING SQUABS

The period of incubation of pigeon eggs is 17 days. The hen pigeon usually lays one egg, skips a day, and then lays again. If more than two eggs are laid it is advisable to remove the extra ones, as a pair of pigeons can raise only two good squabs at one time. The second egg usually hatches a day after the first. The smaller squab in the nest is likely to be the female, so when saving for breeders do not save only the larger squabs from the nest as this will give a much larger percentage of males among the young breeders. Both parents build the nest and take turns sitting on the eggs and feeding the young until they are marketed or until they are able to take care of themselves. The hen often lays another setting of eggs when the squabs are from 2 to 3 weeks of age and leaves the feeding of the squabs from then on largely to the male. Double nests are provided for each pair to discourage the hen from laying again in the same nest with the squabs since she would be disturbed by them during the incubation period.

Squabs are reared and fed by both of the parent birds on a thick, creamy mixture called pigeon milk, produced in the crops of the pigeons. Pigeons usually feed their squabs shortly after they themselves are fed and should not be disturbed at that time. Care should always be taken not to frighten pigeons, and squabs should not be disturbed any more than is necessary. In case a squab dies during

the first week or 10 days, another single squab may be placed in the nest, provided the two are about the same size. This procedure gives the pigeons without squabs a chance to begin producing again sooner than they would otherwise. It requires from 24 to 30 days for a squab to reach market age, the time varying with the size of the breed.

Squabs which are to be saved for breeders should remain in the pen with the parent birds until they are from 7 to 8 weeks of age so that they can learn to eat and take care of themselves. They should be removed at this age as they are likely to disturb the breeders if left in the pen too long.

If the parent birds become sick or die, the young birds may be fed by hand provided they are at least a week old. Only the smaller grains are used for hand feeding until the squabs are 3 weeks old. They should be fed at least 2 and preferably 3 times a day on grain that has been soaked for about 8 hours. It is dropped into the squab's mouth. Enough feed is given to fill but not to stuff the crop.

The production of squabs is greatest in the spring and early part of the summer and reaches the low point in the fall and early in the winter. Mature pigeons usually molt late in the summer and early in the fall and need special care during this period. A small quantity of hempseed is often included in the ration during the molting period. Squabs produced during this period usually are not so good for breeding as those produced during the rest of the year.

FEEDING

The feeding of pigeons differs radically from the feeding of other poultry. The pigeons are not fed any mash or green feed but are fed a ration of whole grains. They do not produce well on the ordinary scratch mixture used for chickens, as this feed is low in protein. From 13 to 15 percent of protein is necessary for good growth of squabs. A high protein grain, such as cowpeas, field peas, or peanuts, must be used in order to get the desired protein content in the ration. As the grains of high protein content are the most expensive ingredients in the ration, it is advisable to use only as much as is needed for good growth.

A good pigeon feed usually contains from 13 to 15 percent protein, 60 to 70 percent carbohydrates, 2 to 5 percent fat, and not more than 5 percent fiber. The minerals are fed in a separate mixture. The grains furnish plenty of vitamin B, and yellow corn contains considerable vitamin A. Peas are a good source of vitamins A and B and contain some vitamins E and G, which add to their value as pigeon feeds.

Proteins are used to build up and repair flesh tissue and are very essential to the production of large squabs of good quality. Carbohydrates and fats furnish the energy requirements and supply material for the formation of fat. Pigeons do not utilize fiber to advantage, and the fiber content should be kept down to about 5 percent. Minerals are needed for good bone growth, for proper balance of the blood, and for the formation of eggshells. Common salt and such elements as calcium and phosphorus are usually deficient in the grain ration and should always be supplied by the use of a special mineral mixture.

Feeds such as soft corn and soft wheat are much lower in digestible nutrients than hard corn or hard wheat. Soft grains not only contain less feed nutrients but are likely to cause bad results in the feeding of

squabs. Good, hard, thoroughly dried grains are much to be preferred. Cracked grains absorb more moisture and spoil more readily than the whole grains, and they are not generally used for pigeon feeding. All pigeon feed should be kept in a dry place, free from weevil infestation. To produce good-sized squabs it is necessary to feed grains that pigeons like and will eat freely.

The selection of the grains to use in a pigeon ration is influenced by the price and availability of the grains and by the results that have been obtained in feeding pigeons. Corn, kafir, peas, and wheat are the grains most commonly used.

A good pigeon feed may be made up as follows:

	Parts, by weight		Parts, by weight
Whole yellow corn-----	35	Oat groats-----	5
Kafir or milo-----	20	Hempseed-----	5
Cowpeas-----	20		
Hard red wheat-----	15	Total-----	100

This feed contains about 13.4 percent crude protein, 70 percent carbohydrates, 3.1 percent crude fiber, and 4.1 percent fat. The corn in this feed may be reduced to 25 parts during the summer months. A simpler ration could be made up by omitting the oat groats and the hempseed.

Corn is one of the best feeds for pigeons and is the basis of all rations used for this purpose. Yellow corn is the principal source of vitamin A in the pigeon diet; white corn should never be used as it is deficient in this vitamin. Either the flint corn or the smaller kernels of yellow-dent corn are the best for pigeons. Cuban and Argentine flint corn are often used in pigeon rations because of their low moisture content. Soft corn should not be used, and cracked corn, unless freshly cracked, is not so good as whole corn.

Kafir and milo are hard, dry grains, similar in composition, and are good feeds for pigeons. These grains lack vitamin A, which is found in yellow corn, but they are good grains to feed with corn. Corn and kafir usually constitute more than 50 percent of the pigeon ration.

All pigeon rations contain about 20 percent of a high-protein seed to bring the protein content up to the desired level. Field or Canada peas have been most commonly used for this purpose, as they are greatly relished by pigeons, and they help to produce nice, plump squabs. In many sections these peas are relatively high in price and are being replaced by cheaper peas, especially the smaller varieties of cowpeas. The Brabham and Whippoorwill cowpeas are very good varieties for this purpose; and a mixture of several varieties of cowpeas, called southern peas, is giving good results. The different varieties of cowpeas are similar in analysis to field peas and are also good sources of vitamin A.

Other high-protein grains used for feeding pigeons for squab production include ordinary garden peas and peanut kernels. These peas are good substitutes for field peas but are usually higher in price. Peanut kernels are high in oil or fat and do not keep so well as peas. Peanuts are somewhat laxative and give best results in rations containing 5 to 10 percent of rice. Half of the peas in the ration may be replaced with peanuts to advantage whenever peanuts are cheaper than peas.

Soybeans are sometimes used but are not relished by pigeons; they contain less vitamin A than peas. It is advisable to change the ration gradually in making use of another high-protein seed, and it may be necessary to let the pigeons get hungry before they will eat the new feed.

Wheat generally makes up from 10 to 25 percent of most pigeon rations. Hard, red wheat is considered a better feed for pigeons than soft wheat. When a soft wheat is used, from 5 to 10 percent of rice is generally included in the ration. Not more than 25 percent of wheat should be included in a pigeon ration, and only a good grade should be fed.

Hulled oats are sometimes used to make up from 10 to 15 percent of the ration and are a good pigeon feed for squab production. The nutrients supplied by all these grains are shown in table 1.

TABLE 1.—*Average composition of pigeon feeds*

Feed	Water	Ash	Crude protein	Carbohydrates		Fat or ether extract
				Crude fiber	Nitrogen-free extract	
Corn:						
Dent.....	Percent	Percent	Percent	Percent	Percent	Percent
12.9	1.3	9.3	1.9	70.3	4.3	
Flint.....	12.2	1.3	10.6	1.0	70.2	4.7
Soft.....	30.6	1.0	7.4	1.2	56.0	3.8
Cowpeas.....	9.8	3.6	23.8	4.3	57.1	1.4
Field peas (Canada).....	9.2	3.4	22.9	5.6	57.8	1.1
Flaxseed.....	9.2	4.3	22.6	7.1	23.2	33.7
Garden peas.....	11.8	3.0	25.6	4.4	53.6	1.6
Hempseed.....	8.0	2.0	10.0	14.0	45.0	21.0
Kafir.....	9.4	1.6	11.1	2.1	72.6	3.2
Millet.....	10.8	3.6	12.1	8.4	61.0	4.1
Milo.....	10.7	2.8	10.7	2.4	70.5	2.9
Oat groats.....	7.9	2.0	16.0	1.5	66.1	6.5
Peanut kernels.....	5.5	2.3	30.2	2.8	11.6	47.6
Rapeseed.....	14.0	3.9	19.4	7.8	16.4	38.5
Rice (polished).....	12.3	.5	7.4	.4	79.0	.4
Soybeans.....	6.4	4.8	39.1	5.2	25.8	18.7
Sunflower seed.....	6.9	3.1	16.1	27.9	21.3	24.7
Vetch seed.....	12.1	2.9	27.5	3.5	52.8	1.2
Wheat.....	10.6	1.8	12.3	2.4	71.1	1.8

A small proportion of other seeds and grains is often used in pigeon rations to add variety. Many kinds are relished by pigeons and add desirable vitamins to the diet. Hempseed is high in fat and seems to be a good feed to use during the molting period. Pigeons are very fond of hempseed, but only from 5 to 10 percent of this seed is used in the ration because of its high fat content and cost.

Millet, buckwheat, rice, rape, and vetch are all good feeds, but only about 5 percent of any one of these is generally used in a pigeon ration. Vetch seed is greatly relished by pigeons and is a favorite seed for feeding racing birds, but is usually too expensive for squab production.

Commercial mixed pigeon feeds are used extensively in feeding pigeons, especially if only a small flock is kept. The quality of these feeds is usually good, and it is easier to buy them for a small flock than to mix the ration at home, on account of the number of grains needed. Dealers often handle 2 or 3 grades of feeds. It usually pays, however, to get the best which contains a considerable quantity of peas, while the cheaper grades have few if any peas in them. The

fat, crude protein, carbohydrate, and fiber analyses of these commercial feeds are marked on the bags.

A suitable mineral mixture is an essential part of the pigeon's diet, as all the grains and seeds commonly fed are low in minerals. A mixture of various minerals, consisting of grit, oyster shell, limestone, salt, and other minerals, is kept before the pigeons all the time. Limestone or granite grits are used, the limestone grit serving as a source of lime and as a grinder, while the granite grit provides only the grinding material. Crushed oyster shell (medium size) provides lime (calcium) used in the formation of the egg shells and bone. Salt is essential in the diet and should make up from 3 to 5 percent of the mineral mixture. Bone meal supplies both calcium and phosphorus. About 10 percent of medium-sized hardwood charcoal is used and is considered of value for absorbing gases. A product, such as Venetian red, containing iron is usually included.

A mineral mixture containing these products may be made as follows:

- 40 percent medium-sized crushed oyster shell.
- 35 percent limestone or granite grit.
- 10 percent medium-sized hardwood charcoal.
- 5 percent ground bone.
- 5 percent ground limestone.
- 4 percent salt.
- 1 percent Venetian red.

The mineral mixture is usually kept slightly moist and is kept before the pigeons in a hopper or open pan.

A constant supply of clean, fresh drinking water should be provided. If fountains are used, they should be constructed so that the pigeons can drink out of them but not bathe in the water. The use of running water, which the pigeons may use for both drinking and bathing, is very desirable.

In feeding pigeons either a self-feeder or hopper may be used, or the grains may be fed by hand 2 or 3 times daily. The use of the self-feeder saves labor and provides ample quantities of feed at all times, but feed left in the pen tends to attract mice. Since pigeons will pick out certain favorite grains it is advisable to put only about 1 day's supply of grain in the hopper at one time. The hopper should be filled only partially and be so constructed that the birds cannot waste the feed. In feeding the grains by hand the quantity should be limited to that which the birds will clean up within an hour. Grain is fed either on the floor or in open troughs, the latter method being more sanitary. Grain not eaten and left on the floor may spoil, and spoiled grain eaten by the pigeons will lead to diarrhea or more serious troubles.

The quantity of feed a given number of breeders will eat depends on the weather, on their appetite and size, and on the number of squabs in the nests. Pigeons consume more feed in cold than in warm weather and need more grain when they are feeding squabs. A pair of good producing Kings, or breeds of that size, will eat about 100 pounds of grain in 1 year; smaller breeds will consume about 10 pounds less, and larger breeds 10 to 15 pounds more. On this basis 100 pairs of Kings would eat an average of about 27 pounds of grain each day. It takes from 7 to 8 pounds of feed to produce 1 pound of squab.

MANURE

Dry pigeon manure may be sold for fertilizer to market gardeners, fruit growers, and florists in some localities at a good price, but it is more commonly used at home. As it is rather rich it has considerable value as a fertilizer and should be mixed with dry dirt or some filling material before it is used. It used to be sold to tanners, but artificial preparations have largely replaced manure for tanning.

PIGEON HOUSES AND EQUIPMENT

For southern or mild sections of the country an open-front house with plenty of ventilation is desirable, while for the colder sections a closed-front type is more desirable. The house should face south and be located on soil which does not hold puddles and otherwise drains well. A pigeon house should be made so that it will provide fresh air,

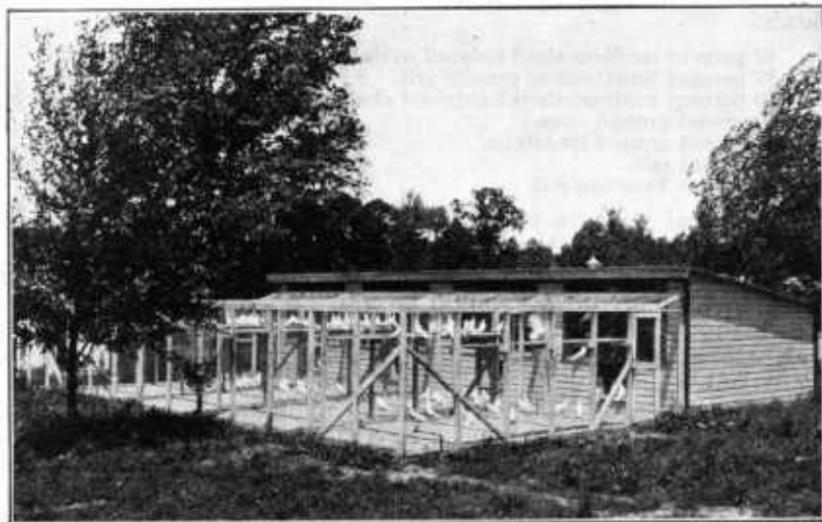


FIGURE 9.—A 4-pen pigeon house. This building is 16 by 40 feet and accommodates about 120 pairs.

sunlight, and space enough to keep the pigeons comfortable. The more sunlight in the house the better, as it helps to dry out the moisture and also helps to keep the building sanitary. The house must be free from drafts, and all walls except the front should be tight.

The shed-roof house is one of the simplest and cheapest types to build and should be about 6 feet high in the rear and 7 to 8 feet in the front (fig. 9). An 18- to 24-inch projection or hood may be built on the front of the house for protection against storms (fig. 10). The depth of the house depends on the number of breeders in each pen and whether or not a separate aisle is included in the house. If the building contains more than 5 pens, a 3-foot aisle in the rear of the building is advisable to allow the use of a wheelbarrow for feeding and cleaning and to permit entrance into any pen without disturbing the birds in other pens. Such a building may be 15 feet deep, with solid partitions every 8 feet apart, allowing pens 8 by 12 feet, each of which will

house from 25 to 30 pairs. This makes a desirable unit for keeping records of breeders. It is difficult to keep accurate records in a larger unit than the one just mentioned.

The house may be made any length desired, depending usually on the number of pigeons to be housed. From $3\frac{1}{2}$ to 5 square feet of floor space should be allowed for each pair of pigeons, depending on the size of the breed. It is poor economy to crowd the pens.

If no aisle is to be put in, the house may be made about 12 feet deep. Every other partition may be made of wire; this practice makes the house cheaper and the pens lighter. The nests are usually placed against the solid sides of each pen.

Other types of houses are used with good results for squab production. Details of the construction of houses are given in Farmers' Bulletin 1554, Poultry Houses and Fixtures. Pigeon houses are usually built of wood and are of about the same style of construction as poultry houses, except that pigeon houses usually are not built so



FIGURE 10.—A 2-pen back-yard pigeon house. This building is 12 by 16 feet and has a capacity of about 50 pairs.

deep. Costs of buildings vary with different conditions and must be estimated from local prices. The shed-roof, 2-pen, 12- by 16-foot house and fly, with a capacity of 50 to 60 pairs, shown in figure 10, cost in Washington, D.C., in 1932, \$60 for material, or about \$1 for each pair of breeders.

Artificial heat is used to some extent in pigeon houses in the North. Enough heat to keep the house dry and comfortable (about 40° F.) tends to increase squab production during the winter months. Good ventilation must always be provided. If double or insulated walls are built they must be so arranged that they will not harbor rats. Well-built houses, in which the birds can be kept comfortable in cold weather (fig. 11), help to increase winter squab production, and it is during this season that the squabs bring the highest prices. Artificial lights are being tried in pigeon houses to determine whether they will increase winter squab production.

Pigeon houses should be so constructed that they can easily be kept free from rats. This may be accomplished by building the house from 12 to 18 inches above the ground, using board floors, and board-

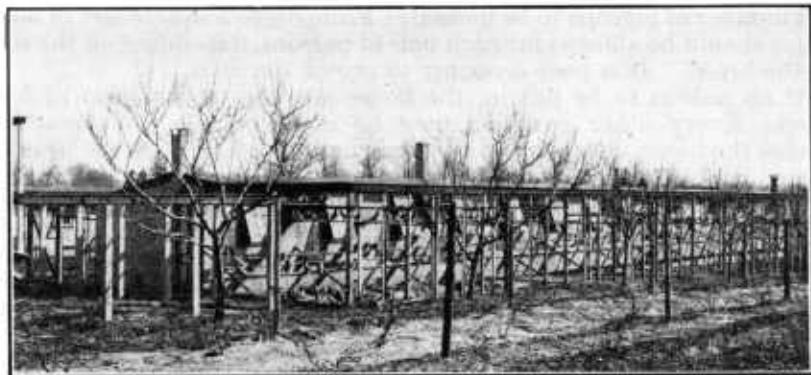


FIGURE 11.—Hip-roof pigeon house (used in New Jersey).

ing up the space between the ground and the floor, but leaving small doors or openings for ventilation and for cats and dogs to get under the house. Concrete makes a very good foundation and floor for a pigeon house as it will keep rats out but should be covered with 1 or 2 inches of sand. A concrete floor should be built from 4 to 8 inches above the outside ground level and over a porous filler of cinders or coarse gravel so that it will be free from ground dampness.

The interior fittings consist of a double nest for each pair of breeders, nest bowls, and feed hopper. Double nests are necessary as the female pigeon will usually lay again before the squabs are old enough to leave the nests. The nests are built in series 4 or 5 tiers high. All interior equipment should be as simple as possible to keep costs low and to facilitate cleaning.

Nest compartments may be 15 inches high, 19 inches wide, and 25 inches long. When the compartments are divided into two nests, as shown in figure 12, these dimensions permit each nest to be 12 inches square and 15 inches high, inside measurements. There is a 6-inch landing board in the front of each double nest, with every other nest partition extending to the front edge of this board. The 5-inch vertical board shown in the front of the nest keeps the nesting material and the squabs from falling out. Each section is built on cleats so that it can be easily removed for cleaning. Nest bowls, which make the nests more sanitary and save nesting material, are used on many farms, but these are not absolutely necessary. A more expensive type of nest with wire fronts and a 6-inch hinged landing board is shown in figure 8. This is 12 by 14 inches and provides good protection for the squabs. Closing the opening permits the nest to be used for mating the birds. Inexpensive nests may be made of egg or orange crates by adding a 6-inch landing platform, extending partitions at the end of each crate, and making a 5-inch strip on the front of the nests.

Hoppers and feed troughs should be good sized and so constructed that the pigeons cannot waste the grain.

Tobacco stems, longleaf pine needles, straw, and hay are all used for nesting material. If nest bowls are used, nesting material is not so necessary but some material is generally provided. The nesting material may be kept in a crate or rack in one corner of the pen to prevent waste.

Pigeons are kept confined by the use of a wire-covered outside fly or yard on the south side of the house. For each pen this fly should be from 6 to 7 feet high, 18 to 21 feet long, and of the same width as the pen. One-inch-mesh wire is best for covering the fly as it keeps out sparrows and rats. It is necessary to extend the wire 12 inches into the ground, making a right angle bend of 12 to 18 inches at the bottom away from the pen to keep out rats. A covering of from 3 to 4 inches of sand or gravel makes an ideal floor for the outside pen, as this drains freely and is easily cleaned. Boards on which the pigeons



FIGURE 12.—Open-front double nests with 6-inch board in front. Nests made of egg crates are shown at the right.

can light should be placed at the bottom of the pigeon hole unless the opening extends to the floor. Running boards about 8 inches wide are placed on the side of the pen, as shown in figure 13.

Bathing facilities should be provided in the yards so that the pigeons can bathe daily. A long trough for both watering and bathing is shown in figure 13. The trough is 5 inches deep by 2 feet wide, extends the width of the fly, and has a drain in the lower end. The water in the trough should be changed twice a day. Water for bathing helps to keep the pigeons in good health and free from insect pests. A galvanized-iron pan about 5 inches deep and from 15 to 20 inches in diameter makes a good bath pan (fig. 10). The pigeons will drink the bath water; therefore these pans should be left in the pens for only 2 or 3 hours each day. Water fountains for drinking may be kept either in the yard or in the house. It is very important to keep all water utensils clean and to keep the pigeon house absolutely dry.

SANITATION

Pigeons can be raised successfully only when the pens and yards are kept clean and the birds are kept free from disease and insect pests. If one begins with healthy stock and gives it proper management there should be no serious disease. On the other hand, crowded houses, poor feeding, damp or poorly ventilated pens, lack of cleanliness in the pens and yards, and careless selection and breeding of the stock may lead to heavy losses in the flock. It is much easier to prevent than to cure disease.

The house should be kept dry, clean, well-ventilated, and free from drafts. The floor should be covered with 1 inch of sand or gravel, and the droppings should be raked off frequently. The outside yards are usually surfaced with sand or gravel and should be kept clean by scraping the surface and adding fresh material. Yards made of con-

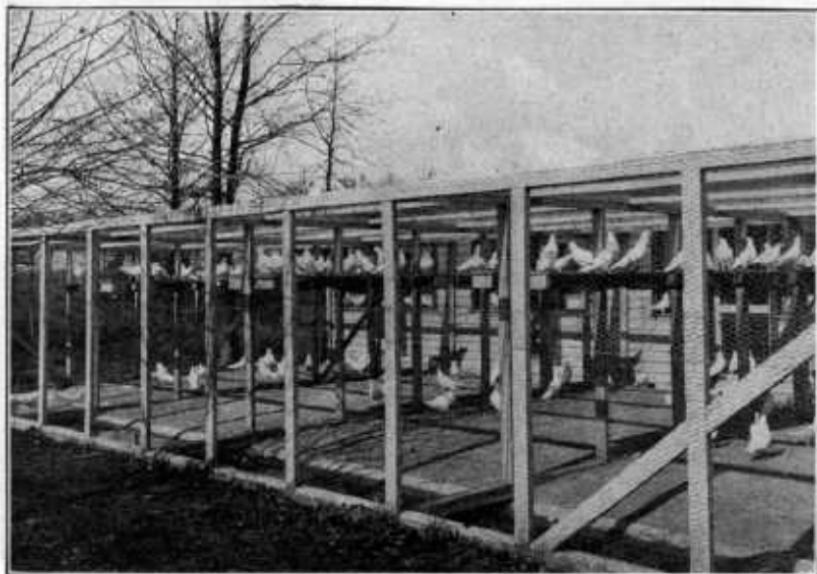


FIGURE 13.—Covered, outside gravel yard. Fresh water is kept in the concrete trough at the end of the yard.

crete covered with a thin layer of sand are still more sanitary. In all cases the yards should be well drained and higher than the natural ground level.

The pens should be cleaned once a week, but nests that contain eggs or squabs should not be disturbed. The nests or nest bowls should be cleaned and the nesting material removed whenever the squabs are marketed or leave the nest. Twice a year the entire pen should be thoroughly cleaned out. The cleaning should include scraping the floor and nests and washing them with hot lye water. A disinfectant or whitewash should be sprayed freely over the entire interior of the pen. One-half pint of compound solution of cresol mixed with 8 quarts of water is a good disinfectant. The nest boxes and landing boards should be examined for mites, especially in hot weather, and if there are any, the boxes and landing boards should

be sprayed with crude oil or carbolineum thinned with kerosene, used engine oil, or creosote oil. If the pigeons have lice on their bodies and wings they should be treated with sodium fluoride, either by dusting by the pinch method or by dipping in water containing 1 ounce of sodium fluoride to each gallon. *not to be used*

CAUSES OF DEATH OF SQUABS

Pigeons are subject to many of the diseases which affect other poultry, and they may be treated in much the same manner. The treatment of poultry diseases and control of parasites are explained in detail in Farmers' Bulletin No. 1652, Diseases and Parasites of Poultry. Roup, pox, and canker, which affect the head and throat, are common pigeon diseases. Tuberculosis and coccidiosis sometimes cause heavy losses in pigeons. Birds affected with the latter diseases gradually grow thin and waste away. Most of the diseases mentioned are contagious, and their spread is favored by insanitary conditions, dirty drinking or bathing water, and poor feeds. Birds having infectious diseases should be killed, and the management conditions improved. Potassium permanganate at the rate of one-third teaspoon to each gallon of water may aid in preventing the spread of disease through drinking water.

Losses are much greater in the squabs than in the mature stock. In addition to the squabs which die from diseases, some are pecked to death by the older pigeons, especially when there are unmated pigeons or extra males in the pens. Lack of vigor in the breeding stock, owing to close inbreeding or to poor management, may cause losses among the squabs. One of the first requirements of success in raising squabs is to see that the pigeons are kept free from disease.

MARKETING SQUABS

Dealing direct with consumers, hospitals, hotels, country clubs, and similar trade, usually offers the best outlet for high-quality squabs. There is a specially good demand for squabs from the Jewish, Chinese, and Italian trade in the larger cities, and this demand is usually for live squabs, whereas practically all other classes of trade require dressed squabs. The majority of squabs are sold to wholesale dealers in the large cities, since this outlet will take any number of squabs at any time although at prices lower than retail.

The price paid for dressed squabs varies with their size and quality, with the season of the year, and with the market location. Some markets quote squabs at so much per pound and others at so much per dozen, these prices varying according to the weight of the squabs. The average seasonal prices, per pound, for dressed squabs weighing 12 pounds to the dozen, according to the wholesale quotations in New York City for the 3-year period 1930-32, were as follows: January and February, 55 cents; March, April, and May, 45 cents; June through September, 35 cents; October, 40 cents; November and December, 50 cents. These prices were from 20 to 25 cents a pound lower than the average for the preceding 3-year period, 1927-29. Small and dark-skinned squabs bring lower prices, and extra-large, attractive squabs slightly higher prices than these quotations.

Squabs grow very rapidly and are marketed at about 26 days of age or when fully feathered under their wings. Squabs at various ages are shown in figures 14 to 19. They must be sold just as soon as they are ready for market (fig. 19 and cover page) because if not marketed at this time they soon lose their baby fat, and their flesh begins to get hard. Squabs from very large breeds take a day or two longer

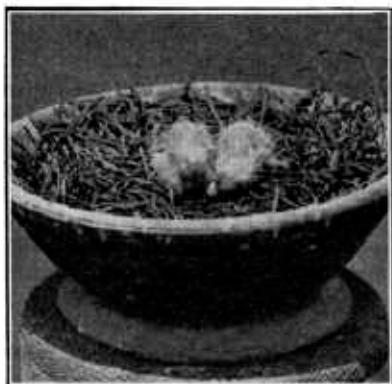


FIGURE 14.—Squabs 24 hours old.

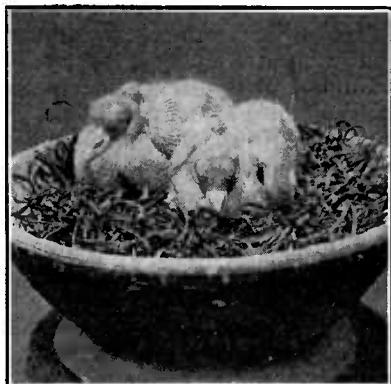


FIGURE 15.—Squabs only 7 days old but several times larger than when hatched.

to reach their best market condition than those from the smaller breeds.

Market squabs should be gathered from the nests the evening before they are to be killed so that the crops will be empty when the birds are dressed. Dressed squabs with full crops bring lower prices than those from which feed was withheld. The usual method of kill-



FIGURE 16.—Squabs 2 weeks old and still growing rapidly.



FIGURE 17.—Squabs 3 weeks old. (Squabs 4 weeks old are shown on cover page.)

ing squabs is to hang them by the feet on a hook or nail, and cut the jugular vein in the mouth just below the base of the skull. A knife with a long slender blade is used. Before the birds are killed the wings may be locked by twisting one behind the other to keep the birds from flapping their wings. The squabs should be dry-picked immediately after they are killed as the feathers are very hard to pull out if the birds are allowed to get cold. Squabs may be picked

on a bench or held in the lap instead of hung up on a wire. They should be picked clean, and all pinfeathers should be removed. The skin of a squab is very tender and tears and bruises very easily.

After the squabs are killed and picked, they are cooled promptly to remove all body heat. Ice-cold water, containing about 1 quart of salt to 8 gallons, is used for this purpose. If the squabs are piled up before cooling or if the water is not kept practically ice cold, the dressed squabs will not keep properly and will show blisters and discolored spots. It takes about 3 hours to cool a squab in ice water, and the birds should then be taken out as they are likely to become soft if left too long in the water. Squabs that are not properly cooled at killing time never make first-quality birds, no matter how well they are chilled later. In cold weather care should be taken to see that the dressed birds do not freeze.



FIGURE 18.—Squab showing pinfeathers on under-side of wing; not quite old enough for market.



FIGURE 19.—Squab 4 weeks old; ready for market and fully feathered under the wing.

Dressed squabs should be washed and then packed in a clean box or tub which has holes in the bottom for drainage. Line the container with clean heavy paper and place a thick layer of cracked ice in the bottom. Pack the squabs, heads down, on this layer of ice with their breasts outward, leaving a little space around the edge of the container for ice. Use alternate layers of squabs and ice, and cover the top with a thick layer of coarsely cracked ice over which burlap or several layers of heavy paper are placed.

The squabs should be shipped to market promptly so that they will arrive in good condition and on the best market days as judged from market reports. If too many squabs are packed together the lower layers are likely to become bruised. Most express companies will allow up to 25 percent off the gross weight for ice packing on shipments of dressed squabs. It is necessary to have a good-sized

flock of pigeons to furnish enough squabs at one time to pay to make express shipments. A local market that will take small lots of squabs is a great help to the small producer.

In shipping live squabs, a crate divided into 2 or 4 sections is used, or the squabs may be shipped in small boxes, not more than 10 squabs being placed together. With larger numbers there is danger of some of the birds being smothered. The live squabs are collected from the nests after feeding time so that their crops will be full when they are shipped. No feed or water is supplied for short shipments.

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